

Instrumentation



FAIRCHILD
INSTRUMENTATION

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FAIRCHILD INSTRUMENTATION



INSTRUMENTS CATALOG

FAIRCHILD INSTRUMENTATION

Fairchild Instrumentation offers industry a broad line of digital multimeters, panel meters, electronic time and frequency measurement instruments, and, the only curve tracer that is fully programable. All of these instruments reflect Fairchild's philosophy to provide high quality, reliable, easy to use digital instrumentation offering the greatest performance for the user dollar. The digital multimeter product line utilizes the patented Dual Slope Integration measurement technique. Dual Slope Integration, the combination of integration and automatic comparison to a precision internal reference, achieves a high degree of stability and noise rejection. Extensive use of integrated circuits in Fairchild instruments provides the capability to offer high performance in digital instrumentation at prices which would otherwise be economically impractical.

Fairchild Instrumentation maintains a comprehensive network of customer oriented sales offices and service centers which are always ready to serve your instrumentation needs. For your convenience, a complete listing of these offices is included on the inside back cover.

All Fairchild instruments are made in the U.S.A. Prices listed are FOB factory, Sunnyvale, California, and are subject to change. Fairchild Instrumentation reserves the right to change designs, models, specifications, and prices without notice. Consult factory for latest information concerning price and delivery.

INDEX

Digital Voltmeters - Multimeters	pages one - six
Panel Meters	pages seven - nine
Frequency/Period Meters - Counters	pages ten - fourteen
Curve Tracers	pages fifteen - sixteen

Fairchild Instrumentation, a Division of Fairchild Camera and Instrument Corporation,
974 East Arques Avenue, Sunnyvale, California 94086. Telephone Area Code (408)
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HALF RACK DIGITAL MULTIMETER— FAIRCHILD MODEL 7000

The Fairchild Model 7000 is a compact four digit instrument which combines high accuracy with moderate cost. These features make it an excellent choice for a variety of general testing and measurement needs in the laboratory and on the production line. Like all Fairchild digital meters, the 7000 combines integration techniques and comparison to an internal reference to achieve both noise rejection and stability.

The 7000 provides DC voltage measurements, with AC measurements, resistance measurements, DC current measurements, auto-ranging, and BCD output available as plug-in circuit board options.

Specifications

DC VOLTAGE MEASUREMENTS

Ranges	1.0000V F.S. + 20% overrange 10.000V F.S. + 20% overrange 100.00V F.S. + 20% overrange 1000.0V F.S.
Accuracy	±0.01% reading ±0.01% F.S.
Resolution	100μV
Integration Time	50ms
Measurement Time	200ms
Input Impedance	1V > 1kMΩ 10V > 1kMΩ 100V ≈ 10MΩ 1000V ≈ 10MΩ
Temperature Range	+ 5°C to + 45°C
Normal Mode Rejection	>30dB at 60 Hz >40dB at 120Hz >50dB at 400Hz
Maximum Voltage	1200 volts on any range with no damage

OPTIONS (Options are plug-in cards)

Option 01—Auto Range	Price \$125.00 Provides auto ranging on all functions of the 7000
Option 02—AC Volts (100kHz)	Price \$450.00
Ranges	1.0000V F.S. + 20% overrange 10.000V F.S. + 20% overrange 100.00 F.S. + 20% overrange 750.0V F.S.
Accuracy	50Hz-10kHz ±0.1% reading ±0.02% F.S. 10Hz-30kHz ±0.25% reading ±0.05% F.S. 30kHz-100kHz ±1.0% reading ±0.2% F.S.
Input Impedance	1MΩ shunted by 75pF
Integration Time	50ms
Measurement Time	1sec
Option 03—Resistance	Price \$110.00
Ranges	1.0000kΩ F.S. + 20% overrange 10.000kΩ F.S. + 20% overrange 100.00kΩ F.S. + 20% overrange 1000.0kΩ F.S. + 20% overrange 10000kΩ F.S.
Accuracy	1kΩ, 10kΩ, 100kΩ: ±0.05% reading ±0.02% F.S. 1MΩ: ±0.1% reading ±0.03% F.S. 10MΩ: ±0.2% reading ±0.05% F.S.
Resolution	100 milliohms
Integration Time	50ms
Measurement Time	200ms

Option 04—DC Current	Price \$175.00
Ranges	1.0000mA F.S. + 20% overrange 10.000mA F.S. + 20% overrange 100.00mA F.S. + 20% overrange 1000.0mA F.S.
Accuracy	±0.13% reading ±0.02% F.S.
Resolution	100nA
Integration Time	50ms
Measurement Time	200ms

Option 05—BCD Output	Price \$125.00 1-2-4-8 BCD Output Logical 0:0V Logical 1: +25V
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Option 06—AC Volts (20kHz)	Price \$350.00
Ranges	1.0000V F.S. + 20% overrange 10.000V F.S. + 20% overrange 100.00V F.S. + 20% overrange 750.0V F.S.
Accuracy	50Hz to 10kHz 0.1% reading ±0.02% F.S. 10kHz to 20kHz 0.2% reading ±0.05% F.S.
Input Impedance	1MΩ shunted by 75pF

Option 07—100mV DC Range	Price, Consult Factory
Manual only, Provides 100mV full scale with 20% overrange	
Accuracy	± (0.01% reading + 0.02% F.S.)
Resolution	10μV
Input Impedance	>100MΩ
Input Offset Current	100pA
Integration Time	50ms
Measurement Time	200ms
Step Response Time	1sec (to read within specified accuracy of final value)
Over Voltage Protection	300V DC or 210V AC

GENERAL

Dimensions	5¼" H x 8¾" W x 12" D, Half rack size
Weight	12 lbs (15 lbs maximum with all options)
Power	115V-220V ±10%, 50Hz-400Hz, <20 watts, no fan
Price	\$1,150.00
with options 01, 02, 03, 04	1,895.00
with options 01, 03, 04, 06	1,795.00

ACCESSORIES

Rack Mount Hardware:

Single unit without slides	
Part #95003000	Price \$35.00
Single unit with slides	
Part #95001400	Price \$90.00
Two units without slides	
Part #95000400	Price \$20.00
Two units with slides	
Part #95000500	Price \$90.00
Bench Handles	
Part #95000600	Price \$15.00
Heavy Duty Carrying Case	
Part #68033301	Price \$150.00



GUARDED DIGITAL MULTIMETER— FAIRCHILD MODEL 7100A

The 7100A is a fully-guarded $4\frac{1}{2}$ digit instrument capable of measuring DC voltage, voltage ratio and resistance. Its high degree of accuracy, its superior stability, and its overranging capability (up 60% on most ranges without loss of accuracy) make it a suitable substitute for five digit instruments in many applications. Remote programming, BCD output, and an AC/DC converter are optionally available.

Specifications

DC VOLTAGE MEASUREMENTS

Ranges	$\pm 100.00\text{mV}$, $\pm 1.0000\text{V}$, $\pm 10.000\text{V}$, $\pm 100.00\text{V}$, $\pm 1000.0\text{V}$ full scale, 60% overranging with no loss in accuracy on 4 lowest ranges, 10% overranging with no loss in accuracy on 1000.0V.
Accuracy	$\pm 0.01\%$ reading ± 1 digit; 100mV range $\pm 0.01\%$ reading ± 2 digits
Stability	Internal Reference $\pm 0.01\%$ for 3 months
Input Resistance	$> 1000\text{M}\Omega$; 100V and 1000V ranges $10\text{M}\Omega$
Auto-Ranging	Operates on both DC volts and resistance
Input Circuit	Floated and guarded, may be operated up to $\pm 500\text{V}$ from chassis ground
Maximum Input	1100V can be applied to all ranges without damage
Measurement Time	250ms, rear panel switch provides a fast setting of 50ms on four high ranges
Common Mode Rejection	140dB at DC, 120dB at 60Hz with up to 1000 ohms connected between either side of the source and the voltmeter input
Normal Mode Rejection	Greater than 20dB at 55Hz with 83 $\frac{1}{3}$ ms integration time, increases 20dB/decade increase in frequency. Virtually infinite rejection at 60Hz and its harmonics

VOLTAGE RATIO MEASUREMENT

Range	$\pm 1.0000:1$ F.S. A full 60% overranging with no loss in accuracy.
Reference Input	$+5$ to $+16\text{V}$, input resistance $3\text{k}\Omega$, 30V maximum input
Accuracy	For reference input of $+9$ to $+16\text{V}$; $\pm 0.02\%$ reading ± 1 digit

RESISTANCE MEASUREMENT

Ranges	$10.000\text{k}\Omega$, $100.00\text{k}\Omega$, $1.0000\text{M}\Omega$ full scale. 60% overranging on all ranges with no loss in accuracy.
Accuracy	$\pm 0.01\%$ reading ± 1 digit; $\pm 0.02\%$ reading ± 1 digit on $10.000\text{M}\Omega$ range

OPTIONS

Option 02—50Hz Operation	No charge Crystal time base changes to give 1/50 and 1/10 second integration time for maximum normal mode rejection at 50Hz
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Option 03—

1-2-2-4 BCD/Programing Price \$175.00

Option 04—

1-2-4-8 BCD/Programing Price \$175.00

GENERAL

Visual Readout	Four full decades plus fifth digit give full range readout of 16000 with display storage. Polarity, decimal point, and measurement units are indicated
Dimensions	5 $\frac{1}{4}$ " x H x 17" W x 20" D
Weight	27 lbs
Power	115V or 220V $\pm 10\%$, 50-60Hz (approximately 50 watts)
Price	\$2,075.00

ACCESSORIES

Rack Mount Hardware:

Without Slides	
Part #95002400	Price \$15.00
With Slides	
Part #95002200	Price \$65.00



MODEL DM-03A AC/DC CONVERTER

This plug-in unit adds AC voltage measurement to the basic capabilities of the 7100A.

Specifications

AC Voltage Ranges	Four manually selected full scale ranges of 1.0000, 10.000, 100.00, and 1000.0 volts rms
Overranging	50% on all ranges except 1000.0 volt range
Frequency Response	30Hz-10kHz plus extended response to 30kHz
Accuracy	$\pm 0.05\%$ reading $\pm 0.02\%$ F.S.
Input Impedance	$5\text{M}\Omega \pm 1\%$ shunted by $< 50\text{pF}$
Price	\$500.00

INTEGRATING DIGITAL MULTIMETER— FAIRCHILD MODEL 7200

The Fairchild 7200 is a precision instrument designed for maximum flexibility use in high accuracy systems or the laboratory. Its unique principle of operation combines the noise rejection features of integrating meters with the stability associated with comparing the input voltage to an internal reference. It is a fully-guarded instrument to provide high common mode rejection. The basic instrument measures DC voltage and ratio and serves as a totalizer up to frequencies of 1MHz. An optional plug-in board provides a time base for frequency measurements. A sepa-

rate plug-in unit for measuring AC voltage is also optionally available. Space is also provided for remote programing, output decoder, and special input filter options. All controls have a logic interlock which minimizes human error in the operation of the instrument.

The 7200 is made with silicon solid-state components and integrated circuits for maximum performance and reliability at a price well below comparable competitive instruments.



Specifications

DC VOLTAGE

Four Ranges—Manual and Remote

1.00000V F.S. + 50% overrange
10.0000V F.S. + 50% overrange
100.000V F.S. + 10% overrange
1000.00V F.S.

Three Ranges—Auto

10.0000V F.S.
100.000V F.S.
1000.00V F.S.

Accuracy (at reference condition)

10V, 100V, and 1000V Ranges
1V Ranges

One second integrating time base
 $\pm 0.005\%$ reading $\pm 0.002\%$ F.S.
 $\pm 0.005\%$ reading $\pm 0.003\%$ F.S.

Resolution

.001% F.S. (10 μ V on 1 volt range)

Input Impedance

Manual Range
1V > 1kM Ω
10V > 1kM Ω
100V > 1kM Ω
1000V $\approx$ 10M Ω

DC RATIO

Range

1:1.00000 + 10% overrange

Accuracy

With external reference voltages of 10V, 30V, 60V and 100V (at reference condition)

$\pm 0.005\%$ reading $\pm 0.002\%$ F.S.

Resolution

0.001% F.S.

Input Impedance For Unknown Signal Input

> 1kM Ω

Input Impedance For External Reference Voltage

> 1kM Ω

Maximum Input Signal

$\pm 110V$

External Reference Voltage Range

± 0.5 to $\pm 110V$

COUNTER

Manual (and programable) start, stop and reset, for totalizer applications

Maximum Count Rate 1MHz

Maximum Display 199999

Sensitivity 100mV rms to 100V rms

OPTIONS

Option 01—

Digital Output Price \$195.00

All functions, decimal points, polarity, numbers and print command are available through a plug-in harness. Digital output is 1-2-4-8 positive true logic level (+12V)

Option 10—

Frequency Time Base Price \$125.00

Provides time base for frequency measurements.

Display

in kHz

Frequency Range

10Hz to 1MHz

Time Base

1sec, 0.1sec, 10ms, front panel and remote control

Accuracy

0.005% reading ± 1 count

Option 11—Programing Price \$150.00

All switches of the instrument are programable through a plug-in harness. Two modes of programing are possible.

a) Isolated contact closure to the internal +12V logic level (approximately 5mA each), resistive load;

b) Provisions are made for two standard size plug-in cards. These cards accommodate level shifts and gates for programing by contact closure or saturated NPN to logic common. Open circuit voltage: +12V; contact load: <1mA, resistive

GENERAL

Common Mode Rejection	With 1k Ω unbalance in either input lead
DC	>140dB
AC	60Hz >120dB
Normal Mode Rejection	True integrating technique provides maximum noise rejection
Integrating Time Base	Manual and programable 1.0sec, 0.1sec, and 10ms
Polarity	Automatic
Range Response Time	30ms
Notch Filter	The 7200 has a 60Hz Twin-T input filter (front panel switch, and programable). Provisions are made for other types of input filters.
Dimensions	5 1/4" H x 17" W x 20" D
Weight	31 lbs, 37 lbs with DM-10
Power	115-220V $\pm$ 10%, 50-400Hz, less than 30 watts, no fan
Price	\$3,500.00

ACCESSORIES

Rack Mount Hardware:	
Part #95001000	Price \$15.00



AC VOLTAGE MEASUREMENT

PLUG-IN

Model DM-10

This AC converter is a plug-in unit for the 7200. Power supplies are self-contained so that the unit can be adapted into an AC/AC ratiometer. The AC conversion is proportional to the average value of the applied AC voltage. The output is calibrated in rms based on a sine wave input.

Specifications

RANGES

Four Ranges, Manual and Programable	1.00000V F.S. $\pm$ 50% overrange
	10.0000V F.S. $\pm$ 10% overrange
	100.000V F.S. $\pm$ 10% overrange
	1000.00V F.S.

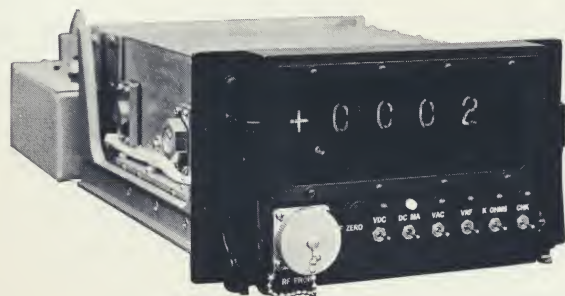
COMBINED ACCURACY AND FREQUENCY

Response (with Model 7200)

10V, 100V and 1000V Ranges	30Hz-10kHz $\pm$ 0.05% reading $\pm$ 0.02% F.S.
	10kHz-20kHz $\pm$ 0.1% reading $\pm$ 0.03% F.S.
	20kHz-50kHz $\pm$ 0.2% reading $\pm$ 0.05% F.S.
	50kHz-100kHz $\pm$ 0.5% reading 0.1% F.S.
1V Range	30Hz-10kHz $\pm$ 0.1% reading $\pm$ 0.05% F.S.
	10kHz-20kHz $\pm$ 0.2% reading $\pm$ 0.1% F.S.
	20kHz-50kHz $\pm$ 0.5% reading $\pm$ 0.2% F.S.
	50kHz-100kHz $\pm$ 1.0% reading $\pm$ 0.5% F.S.

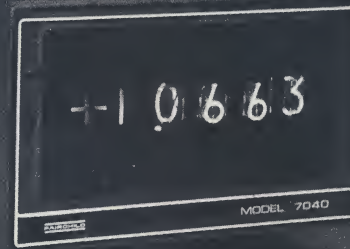
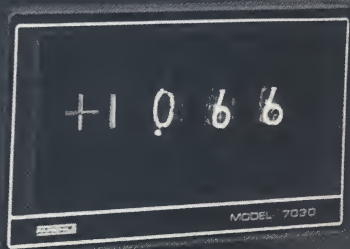
RESPONSE TIME

Manual and Programable	Fast/Slow with crossover at approximately 400Hz
Fast	300 ms
Slow	2sec
Price	\$995.00



MILITARIZED INSTRUMENTATION

Military applications demand a high degree of ruggedness and quality in an electronic instrument. Specifications are much more inclusive and rigid. The Fairchild Model 7460MR is an extremely compact four digit Digital Multimeter with polarity indication which is presently being supplied in production quantities for military applications. It is qualified under such severe environmental conditions as RFI, shock, vibration, and high humidity. The 7460MR is manually or remotely programable, measures DC voltage and current, AC and RF voltage, and resistance. Detachable high voltage probes are provided to extend the RF voltage range to 50MHz and the DC voltage range to 30kV. The unit is very small and lightweight, measuring 9 1/2" W x 5" H x 12" D and weighing only 15 pounds. It is a compact, rugged, quality instrument combining durability, ease of operation, and the ability to operate in severe environmental conditions. The 7460MR is covered by a complete military documentation package and is manufactured and tested under military quality control.



**MODEL 7030 THREE DIGIT PANEL METER
OVERRANGE - DUAL POLARITY—6 READINGS/SECOND**

1.999V F.S. (STANDARD)	19.99V F.S. (OPTIONAL)	199.9V F.S. (OPTIONAL)	199.9mV F.S. (OPTIONAL)	1000V F.S. (OPTIONAL)
1mV	10mV	100mV	100 μ V	1V
100M Ω	10M Ω	10M Ω	100M Ω	10M Ω
$\pm 300V$	$\pm 1000V$	$\pm 1000V$	$\pm 300V$	$\pm 1000V$
$\pm (0.1\% \text{ of reading} + 0.05\% \text{ of F.S.})$			$\pm (0.1\% \text{ of reading} + 0.1\% \text{ of F.S.})$	

500V DC with respect to ground

<300msec

>80 dB

>26 dB at line frequency

115V $\pm 10\%$ —12W—50-400Hz—(100, 220, 230V Optional, no charge)

1 - 9	\$299.00	Add \$20.00 for optional input ranges
10 - 24	\$289.00	
25 - 49	\$280.00	Mating connector (2 required) \$4.00 ea
50 - 99	\$265.00	
100	\$251.00	

Model 7035 REMOTE READOUT (Requires Option 01 to drive) \$100.00

**MODEL 7040 FOUR DIGIT PANEL METER
OVERRANGE - DUAL POLARITY— 6 READINGS/SECOND**

1.2000V (STANDARD)	12.000V (OPTIONAL)	120.00V (OPTIONAL)	1000.0V (OPTIONAL)
100 μ V	1mV	10mV	100mV
100M Ω	10M Ω	10M Ω	1M Ω
$\pm 300V$	$\pm 1000V$	$\pm 1000V$	$\pm 1000V$
$\pm (.05\% \text{ of reading} + .01\% \text{ of F.S.})$			

500V DC with respect to ground

<200msec

115V $\pm 10\%$ —13W—50-400Hz—(100, 220, 230V Optional, no charge)

1 - 9	\$495.00	Add \$25.00 for optional input ranges
10 - 24	\$480.00	
25 - 49	\$465.00	Mating connector (2 required) \$4.00 ea
50 - 99	\$450.00	
100	\$435.00	

Model 7045 REMOTE READOUT (Requires Option 01 to drive) \$125.00

es included, \$25.00. Provides 1-2-4-8 positive true buffered BCD outputs. PRINT PULSE: Positive going 100 μ s 4V pulse. "1" STATE: +4.0 $\pm .25V$.

ATIO REFERENCE INPUT: +0.5 to +1.999V DC. INPUT IMPEDANCE: >1M Ω . MAXIMUM INPUT: 100V. ACCURACY: 1.999 to 199.9V F.S. $\pm (.2\% \text{ of reading} + 2\% \text{ of F.S.})$; 199.9mV F.S. range, $\pm (.2\% \text{ of reading} + .3\% \text{ of F.S.})$.

AC voltage, and resistance capability for all three panel meters, consult factory.

**LOW COST FREQUENCY METER—
FAIRCHILD MODEL 8040**



The Model 8040 Frequency Meter is the latest example of high performance, low cost digital instrument packages developed by Fairchild Instrumentation.

The Model 8040 is a four digit, 2MHz frequency meter utilizing the same compact package as the Model 7050 Digital Multi-meter. The 8040 is the only four digit, 2MHz low cost counter presently available. Because of a unique logic sequence which prescales the input signal by 100 or by 10, effective gate times

of either 1 or 10 milliseconds result, enabling observations of the most significant digits even at the highest input frequencies. The unit offers fixed attenuation in three positions and at any one of these positions, the input will accept 260 volts rms at 50 or 60Hz without damage. This is ideal in industrial situations where the operator may not be fully aware of the magnitude of the signal being measured. The standard version is available as a 60Hz unit, with 50Hz and a fifth digit offered as options.

Specifications

FREQUENCY MEASUREMENTS

Range	10Hz to 2MHz
Accuracy	±1 count ±time base accuracy
Display	kHz with selected decimal point
Gate Times	10sec, 1sec, 0.1sec, 10ms, 1ms
Test Function	Reads 1200 (1000 with 50Hz time base)
Totalize Function	Totalizes when gate is manually opened and closed by function select switch
Input Sensitivity	100mV 10Hz to 2MHz Attenuation X1, X10, X100, selected by slide switch. Variable trigger level control with preset position, AC coupled input
Impedance	Approximately 1MΩ shunted by 35pF
Overload	260V rms on X1, X10, and X100 attenuation without damage at 50 or 60Hz

GENERAL

Signal Polarity	Level control allows counting either positive or negative input pulses
Display	4 digits with display storage
Time Base	60Hz line typically better than 0.1%
Operating Temperature	0 to 50°C
Dimensions	3¼" H x 6¾" W x 7¾" D (8¼" D including knobs)
Weight	Approximately 3½ pounds
Power	115V ±10%, 60Hz, 10 watts, others optional

OPTIONS

Option 01 - Fifth Digit Price \$75.00

PRICE

115V - 60Hz	1 - 9	\$349.00
	10 - 24	340.00
	25 - 99	333.00

Specify alternate power supply models—100, 115, 220, 230V @ 50Hz or 60Hz—no additional charge.

ACCESSORIES

Rack Mount Hardware:

3½" high; Will hold one or two 8040's

Part #95000000 Price \$30.00

Tilt Stand/Handle

Part #93000258 Price \$16.00

**30 MHz FREQUENCY/PERIOD METER—
FAIRCHILD MODEL 8050**



The Model 8050 Frequency/Period Meter is the only low cost frequency counter providing 30MHz capability presently available. This unit utilizes the most economical combination of integrated circuits to achieve quality performance—T²μL for fast switching circuits and RTL for slow speed switching—resulting in a very compact quality counter at low cost. A high degree of immunity to power supply transients and noise is accomplished through the use of a dual FET input stage, complimentary amplifier, and complimentary shaper circuitry. The 8050 provides an input attenuator switch with two positions of DC coupled attenuation and one position of AC coupled attenuation, offering a consistent input characteristic over the dynamic range of input signals. Additional features such as trigger level control, the ability to accept pulse waveforms of either polarity, five gate times, and multiple period averages make the Model 8050 comparable with much more expensive units. Quality construction using plated-through printed circuit boards increases reliability.

Specifications

FREQUENCY MEASUREMENTS

Range	DC to 30MHz DC coupled, 10Hz to 30MHz AC coupled
Pulse Pair Response	16ns min. width, 30 ns min. time between pulses pos. or neg., triggers on pos. slope
Accuracy	±1 count ±time base accuracy
Displays	kHz with selected decimal point
Gate Times	10sec, 1sec, 0.1 sec, 10ms, 1ms
Test	Counts 100kHz on 0.1sec gate

PERIOD & MULTIPLE PERIOD AVERAGE RANGE

	Single period 0.1ms minimum
	Mult. period 0.5μs minimum for 10, 100, and 1000 periods
Accuracy	±1 count ±time base accuracy ±trigger error periods averaged
	Trigger error for 0.1V rms sine wave input is 0.3% for signals with 40dB signal-to-noise ratio
Reads In	Milliseconds with automatically positioned decimal point
Periods Averaged	1, 10, 10 ² , 10 ³
Frequency Counted	100kHz

TOTALIZE FUNCTION

	Gate is manually opened and closed by function select switch
Time Base	
Frequency	1MHz, rear panel adjustment provided
Aging Rate	< ±2 parts in 10 ⁶ /Month
Temperature Coefficient	0.003% over 0 to +45°C range, referenced to 25°C
Line Voltage	1 part in 10 ⁶ for ±10% variation in line voltage
Display	5 digits, with display storage and 3 fixed display times
Sensitivity	100mV rms sine wave: 300mV peak to peak for pulses Attenuator: DCX1, X30, ACX1, selected by slide switch; continuously variable level control, AC and DC coupled input
Impedance	Approximately 1MΩ shunted by 25pF
Overload	50V rms on attenuator X1 position (300VDC on ACX1 position) 500V peak to peak on attenuator X30
Signal Polarity	Level control allows counting either positive or negative input pulses. (triggers on positive slope)

GENERAL

Operating Temperature Range	0 to +45°C
Dimensions	3¼" H x 6¾" W x 7¾" D (8¾" D including knobs)
Weight	3½ pounds
Power Requirements	115V ±10%, 60-400Hz, 11 watts
	Specify alternate power supply models—100, 115, 220, 230V @ 50Hz or 60Hz—no additional charge.

PRICE

115 - 60Hz	1 - 9	\$695.00
	10 - 24	680.00

ACCESSORIES

Rack Mount Hardware:	
3½" high; Will hold one or two 8050's	
Part #95000000	Price \$30.00
Tilt Stand/Handle	
Part #93000258	Price \$16.00

12.5MHz UNIVERSAL COUNTER-TIMER— FAIRCHILD MODEL 8200

The 8200 incorporates the latest design concepts and a wide range of measurement flexibility—making it the most up-to-date instrument in its class. Extensive use of integrated circuits assures high reliability and maximum space and weight savings. Special design features include a low noise differential FET input amplifier yielding superior accuracy single period measurements than previously available in an instrument in its class.

A wide variety of options are available with the 8200 to assure a high degree of compatibility with other instruments and systems. Readout is by means of bright, easy-to-read, in-line indicators. A switch selected readout storage mode can be utilized to provide a non-blinking display.

Specifications

FREQUENCY MEASUREMENT

Range	0 to 12.5MHz
Input Channels	A or B
Gate Times	1 μ s to 10sec in decade steps
Accuracy	± 1 count $\pm$ time base accuracy

PERIOD MEASUREMENT

Frequency Range	0 to 2MHz
Input Channels	A or B
Accuracy	± 1 count $\pm$ time base accuracy $\pm$ trigger error*

MULTIPLE PERIOD AVERAGE MEASUREMENT

Frequency Range	0 to 2MHz
Input Channels	A or B
Periods Averaged	10 ⁰ to 10 ⁷ in decade steps
Accuracy	± 1 count $\pm$ time base accuracy $\pm \left(\frac{\text{trigger error}^*}{\text{period averaged}} \right)$

FREQUENCY-RATIO MEASUREMENT

Frequency Range	f ₁ (Channel A or B input): 0 to 12.5MHz f ₂ (Channel B or A input): 0 to 2MHz
Measures	f ₁ /f ₂ x multiplier
Multipliers	10 ⁰ to 10 ⁷ in decade steps
Accuracy	± 1 count of f ₁ $\pm \left(\frac{\text{trigger error of } f_2^*}{\text{multiplier setting}} \right)$

TIME INTERVAL MEASUREMENT

Input Channels	A and B
Resolution	100ns
Range	0.5 μ s to 10 ⁷ sec
Accuracy	± 1 count $\pm$ time base accuracy $\pm$ trigger error of A* and B*

*With trigger level set at zero, either slope, trigger error for sine-wave is less than $\pm 0.3\%$ of one period for signals with 40dB or better signal-to-noise ratio. Trigger error decreases as signal amplitude and slope increases.

TOTALIZING

Maximum Count Displayed	9,999,999
Maximum Counting Rate	12.5MHz
Input Channel	A or B
Start and Stop	Selected by function switch

DISPLAY

Number of Decades	7 decades with automatically positioned decimal point
Display Tubes	In-line long life decimal display tubes
Display Storage	Holds reading between samples, switch overrides storage
Time	Adjustable from less than 0.1 second to greater than 5.0 seconds, independent of gate time. Display time control includes an infinite-display time position

INPUT SPECIFICATIONS

Channels A and B

Sensitivity	A. 0.1 volts rms for sine-wave input B. 0.3 volts rms for positive- or negative-pulse input (50ns minimum width)
Maximum Input	50V rms without damage on X1 attenuator setting, 500V peak without damage on all other ranges
Impedance	Approximately 1M Ω shunted by 50pF
Attenuation Factors	1, 10 and 100
Trigger Level	$\pm 1V$, $\pm 10V$, and $\pm 100V$ continuously variable; trigger on positive or negative slope; separate control for each channel
Pulse Pair Resolution	50ns separation for pulses of 0.3V amplitude, 50 ns minimum width
Output Markers	Approximately 12V negative pulses from 1k Ω source approximately 10 μ s wide for oscilloscope Z axis modulation. Markers are switch selectable, mixed or separate.

TIME BASE

Source	1MHz internal crystal oscillator
Stability as a Function of Aging	$< \pm 2$ parts in 10 ⁷ per month
Temperature	$< \pm 3$ parts in 10 ⁷ (0° to +55°C)
Line Voltage ($\pm 10\%$)	$< \pm 1$ part 10 ⁷
Signal Outputs	1MHz approximately 2 volts peak-to-peak; 1k Ω source
Time Base	1MHz to 0.1Hz in decade steps; greater than 3.0 volts peak-to-peak Available in count function without reset interruptions
Scaled A or B Signal	A or B frequency (0 to 2.0MHz) divided by 10 ⁰ to 10 ⁷ in decade steps; approximately 3.0 volts peak-to-peak $< 5k$ source; available at the time base out/jack
Scaled External Clock Input	Input divided by 10 ⁰ to 10 ⁷ in decade steps. Greater than 3.0 volts peak-to-peak $< 5k$ source, available in count function without reset interruptions
Trigger Outputs	Front panel tip jacks provide shaped outputs from A and B input amplifiers
Operating Temperature Range	(0°C to +40°C with fan off) 0° to +55°C with fan on, switch for fan on rear panel



OPTIONS

Option 01—Digital Output BCD Voltages

Price \$125.00
4-line Binary-coded decimal (1-2-4-8)
"0" level: more negative than + 0.6 volts
"1" level: more positive than + 11.0 volts

Option 02—Digital Output BCD Voltages

Price \$125.00
4-line Binary-coded decimal (1-2-4-8)
"1" level: more negative than + 0.6 volts
"0" level: more positive than + 11.0 volts

Option 03—Remote Control

Price \$95.00
All functions except trigger level and display time by contact closures to ground
NOTE: Combination of options 01 or 02 and 03 \$145.00

Option 04—Rear Input

Price \$25.00
A and B channel BNC input connectors on rear panel, in parallel with front panel inputs

Option 05—High Stability 1MHz Oscillator

Price \$190.00
±3 parts in 10⁶ per day

GENERAL

Dimensions	3½" H x 16¾" W x 14½" D
Weight	18 lbs
Power	115V or 230V ±10%, 50-400Hz (fan operates on 50-60Hz only); 50 Watts
Price	\$1,395.00

ACCESSORIES

Furnished

3-conductor AC power cord
2 each 4 ft coaxial cables, with male BNC connector on both ends
Board extractor
Extender board

Not furnished

Rack Mount Hardware:

Without Slides Part #95000700	Price \$15.00
With Slides Part #95000800	Price \$85.00
Bench Handles Part #95000900	Price \$12.00

500MHz DIGITAL FREQUENCY METER— FAIRCHILD MODEL 8220

The 8220 has been designed to meet the needs of the communications industry as well as other industrial and laboratory areas where an easily obtained, direct reading digital indication of a wide range of frequencies is required. Maximum usage of integrated circuits with all plug-in board construction results in an instrument with inherent high reliability. In addition, its compact, lightweight package makes the 8220 ideal for portable operation. No tuning adjustments are required for direct reading across entire range of 10Hz to 500MHz, assuring easy operation by inexperienced personnel. Readout is displayed by means of 7 bright, easy-to-read, in-line indicators. Readout storage is provided for a non-blinking display. The size, weight, performance, operational convenience and cost make the 8220 Digital Frequency Meter an excellent instrumentation value in its class.

MODEL 8220 MAIN FRAME

Specifications

FREQUENCY MODE

Range	10Hz to 50MHz
Gate Time	0.1sec, 1sec, 10sec
Accuracy	± 1 count plus $\pm$ time base accuracy
Reads In	kHz with positioned decimal point
Self Check	Counts internal 1MHz clock for 1 second gate time

COUNT MODE

Maximum Count Displayed	9,999,999
Maximum Count Rate	50MHz
Gate Length	ON/OFF manual control

TIME BASE

Frequency	1MHz
Aging Rate	3 parts in 10^7 per week after 1 day continuous operation. 2 parts in 10^7 per month after 1 month continuous operation

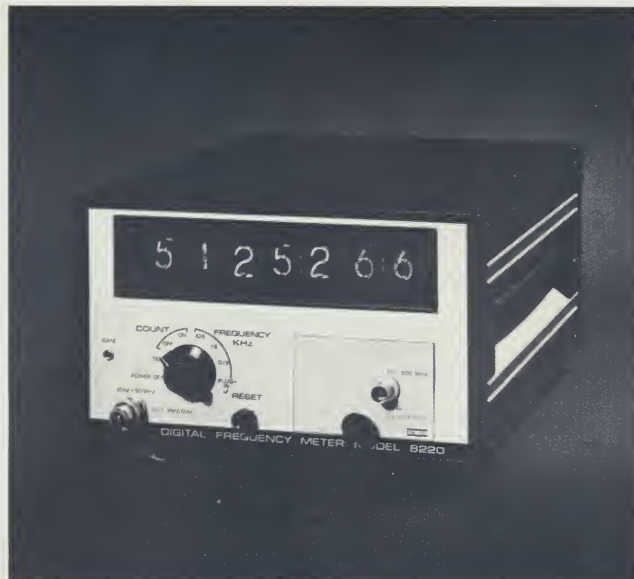
Temperature Stability	± 3 parts in 10^7 over 0 to $+55^\circ\text{C}$ range
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INPUT SPECIFICATIONS

Sensitivity	50mV rms, 10Hz to 50MHz
Impedance	Approximately $100\text{k}\Omega$ in parallel with 40pF
Coupling	0.22 μF 600V DC capacitor
Maximum Input Without Damage	150V rms or 600V DC peak value
Input	Front panel BNC connector

GENERAL

Display	7 digits in-line using long life indicators with display storage
Display Time	Gate Time plus approximately 0.1sec
Operating Temperature Range	0°C to $+55^\circ\text{C}$
Dimensions	5 $\frac{1}{4}$ " H x 9" W x 12 $\frac{1}{2}$ " D
Weight	15 lbs with plug-in
Power	115 or 230V rms (switch selectable), 50-60Hz, 30 watts
Price Including FM-01	\$1,695.00



ACCESSORIES

Furnished	Male BNC to male BNC cable 48" long, detachable AC power cord 8' long
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Not Furnished

Rack Mount Hardware:

Single unit left or right hand mounting

Part #95000200	Price \$35.00
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Dual unit for mounting 8220 with Fairchild Model 7000 half rack DVM in 19" panel

Part #95000100	Price \$45.00
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Bench Handles

Part #95000600	Price \$12.00
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Heavy Duty Carrying Case

Part #68033301	Price \$150.00
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MODEL FM-01 500MHz PRESCALER

The Model FM-01 is a standard plug-in module for the Model 8220 and extends its operating range to 500MHz. The stability and accuracy of the basic counter are retained in these extended frequency measurements, assuring simple and convenient operation by non-technical personnel. All necessary power for the FM-01 is supplied by the Model 8220 main frame.

Specifications

Frequency Range	50MHz to 500MHz
Sensitivity	100mV
Impedance	Approximately 50Ω
Maximum Input Without Damage	5V rms
Input	Front panel BNC connector
Operating Range	0°C to $+55^\circ\text{C}$
Power Required	Supplied by Model 8220 main frame

TRANSISTOR CURVE TRACERS AND PROGRAMER

The 6200B is a semiconductor curve tracer capable of testing state-of-the-art devices. Continuous control of the base drive amplitude, low drive levels, and pulsed operation make the instrument a versatile laboratory tool. The 6200B displays one or more characteristic curves of two and three terminal devices. In the usual grounded emitter configuration for testing transistors, a CRT plot of base or collector voltage versus collector current at the various drive levels may be obtained. The connections can be interchanged to show curves for a grounded base configuration. For an FET, the curves show gate or drain voltage versus drain current; and, for an SCR, gate or anode voltage versus anode current. The collector sweep generator provides both positive and negative sweeps with continuously adjustable peak values of 0-1000 volts, 0-200 volts, and 0-20 volts. A selectable resistance may be switched in series with the collector sweep generator to limit the maximum current to protect devices in the breakdown region. The driving source or input to the device under test is the base step generator. The step levels of the generator are determined by range, multiplier, and step number controls. The first and last steps from the generator are selected from the front panel of the instrument. The multiplier is a calibrated ten turn vernier which adds considerable convenience to the instrument. Not only does it allow precise selection of the drive levels, but also it simplifies β measurements.

In addition to continuous voltage or continuous current drive, the 6200B features "pulsed" operation. In this mode the drive is applied at the peak of the sweep and the device is only turned on for short periods of time. Pulsed operation permits many devices to be checked without heat sinks and allows characteristics to be viewed at higher powers without exceeding safe dissipation levels.

The deflection system combines high stability with excellent sensitivity. The vertical sensitivity extends to $1\mu\text{A}/\text{division}$ to accommodate the latest devices. Both the horizontal and vertical axes of the display can be inverted if desired. This permits PNP transistor and "P" channel FETs to be viewed in a normal manner instead of inverted.



Specifications

CATHODE RAY TUBE DISPLAY

Vertical (Collector Current)

Range $1\mu\text{A}/\text{div}$ to $500\text{mA}/\text{div}$
Accuracy $\pm 3\%$ of reading

Horizontal (Collector Voltage)

Range $10\text{mV}/\text{div}$ to $100\text{V}/\text{div}$
Accuracy $\pm 3\%$ of reading

Horizontal (Base Voltage)

Range $100\text{mV}/\text{div}$, $200\text{mV}/\text{div}$, and $500\text{mV}/\text{div}$
Accuracy $\pm 3\%$ of reading

Sweep Generator (Collector Voltage)

Sweep Voltage Variable as follows:
 0 to $\pm 20\text{V}$ @ 5A
 0 to $\pm 200\text{V}$ @ 500mA
 0 to $\pm 1000\text{V}$ @ 100mA

Overload Protection Magnetic circuit breaker with front panel reset

BASE GENERATOR

Number of Steps 0 to 10 with independent selection of first and last steps at front panel controls

STEP FUNCTIONS

Current Mode Ranges $0.1\mu\text{A}$, $1\mu\text{A}$, $10\mu\text{A}$, $100\mu\text{A}$, 1mA , and 10mA per step

Voltage Mode Multiplier Range

Ranges 10mV , 100mV , and 1V per step
 Multiplies range by 1 to 11 , adjustable at front panel

Accuracy Maximum Current Maximum Voltage Pulsed Base Mode

$\pm 2\%$ of setting $\pm 1\%$ F.S.
 500mA
 35V
 Applies power to base for approximately $800\mu\text{s}$ during peak of collector voltage; this reduces duty cycle to device under test to about 10%

GENERAL

Dimensions $9\frac{1}{4}"$ H x $16\frac{3}{4}"$ W x $19\frac{1}{2}"$ D ($13\frac{1}{2}"$ H w/programer)
Weight 50 lbs
Power $115/230\text{V} \pm 10\%$, 200W , $50-60\text{Hz}$
Price $\$1,575.00$

ACCESSORIES

Rack Mount Hardware:

With Slides
Part #9502000 Price $\$65.00$

The 6200B/P is a programmable version of the Model 6200B. With its companion Model 3509B sequencer unit, up to 5 sequential tests of different parameters may be performed by the 6200B/P.

Specifications

COLLECTOR SWEEP GENERATOR

Sweep Ranges*	0 to 1000V, 100mA 0 to 200V, 500mA 0 to 20V, 5A
Polarity*	Positive or negative
Overload Protection	Circuit breaker, with front panel reset
Collector Series Resistance*	Selectable 3 Ω to 1 M Ω in eleven steps (Two programmable values)

BASE STEP GENERATOR

Voltage Range**†	(Continuously Variable) 10mV to 35 volts
Current Range**†	(Continuously Variable) 100nA to 500mA
Pulse Mode Duty Cycle*	Less than 10%
Number of Steps	0 to 10 first and last steps selected independently
Polarity*	Positive or negative
Vertical Display Collector Current*	1 μ A/division to 500mA/division
Horizontal Display Collector Current*	10mV/division to 100V/division
Base Voltage*	100mV/division, 200mV/division, 500mV/division

PRICE

\$2,350.00

ACCESSORIES & SPECIAL MODIFICATIONS

The Model 6200B/P when ordered with 3509B Programmer includes the following at no additional charge:
6200B/P-3509B interconnect cabling, dual transistor test fixture, power cable, one set of programming cards (less diodes and program), and one instruction manual.

ADDITIONAL ACCESSORIES

Dual Transistor Test Fixture	
Part #6620-30	Price \$65.00
High Speed Transistor Test Jig	
Part #3401-1560	Price \$50.00
High Speed Diode Test Jig	
Part #3401-1570	Price \$35.00
Long Lead Transistor Test Jig	
Part #3401-1580	Price \$10.00
Extender Card	
Part #6950-30	Price \$15.00
Rack Mount Hardware:	
With Slides	
Part #95002000	Price \$15.00

*Each function fully programmable

†Multiplier vernier setting and/or fixed values X1, X2, X5 (internal)



3509B PROGRAMMER

This unit will program the Model 6200B/P Curve Tracer to automatically display up to five tests on a single device.

Specifications

DEVICE LEAD CONNECTION

The connections between the leads of the device under test and the 6200B/P Curve Tracer are controlled by a reed relay matrix in the 3509B.

Modes of Operation

Manual or automatic advance selected by front panel switch. Can be remotely programmable.

Test Time (Automatic Mode)

Adjustable from approximately 70 to 800ms/test, from front panel

GENERAL

Power	From the Curve Tracer
Mechanical Dimensions	5¼" H x 16¾" W x 19½" D
Weight	14 lbs
Price	\$600.00

ACCESSORIES

Rack Mount Hardware:

Part #95002400	Price \$65.00
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| ☐ Fairchild Counters | ☐ I am particularly interested in Model_____ |

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Title_____ Company_____

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